REMARKS

Claims 1-33 remain pending in the present application. Applicant greatly appreciates the thorough examination of the present application and the indication of allowable subject matter in dependent claims 3, 12, 20, 21, 27 and 30. Clarifying amendments have been made to claim 9 and 32 to address the rejection under 35 U.S.C. §112, second paragraph. Accordingly, reconsideration and allowance for all of the claims in the present application as amended are earnestly solicited in view of the following remarks.

Claims 8 and 32 stand rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 9, which appears to be the claim intended to be rejected, and claim 32 have been amended to address the concerns raised in this rejection. Accordingly, it is respectfully submitted that claims 1-33 are in compliance with the requirements of 35 U.S.C. §112, second paragraph, and it is respectfully requested that this rejection be reconsidered and withdrawn.

Claims 1, 2, 4-11, 13, 22-26, 28, 29 and 31-33 stand rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,221,169 to Bernstein et al. in view of U.S. Patent Publication No. 2002/0098713 to Henley et al. and claims 14-19 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Bernstein et al. in view of Henley et al. and in further view of U.S. Patent No. 6,182,604 to Goeckner et al. These rejections are respectfully traversed.

Claims 1, 23 and 28 of the present application are respectively directed to apparatus, method and system for processing a semiconductor wafer by beamline ion implantation and plasma doping in an integrated process chamber. Presently, beamline ion implantation and plasma doping are performed in separate apparatus due to the different operation requirements. For instance, because the process environment for plasma doping is significantly different from the process environment for beamline ion implantation by requiring the pressure within the chamber to be maintained higher for beamline ion implantation than for plasma doping, these two processes are completed in separate systems. As a result, the present invention is directed to apparatus, method and system that are receptive to both processes in an integrated chamber by moving and positioning the wafer in an appropriate portion thereof for the

desired process. By integrating these two distinct processes into a single system, a reduction in the cost and time of processing wafers over a wide range of energy levels may be realized. Therefore, the apparatus, system and method recited in the claims of the present application provide a unique and novel technique for integrating the operations associated with beamline ion implantation and plasma doping into an integrated apparatus, method and system.

Bernstein et al. disclose an ion beam implanter 10 as generally shown in Fig. 1. The implanter 10 includes a beamline assembly 16 for generating ions to implant into wafers at an end station 18. The implanter 10 further includes an ion extractor assembly 24 having a plasma chamber 22. However, the plasma chamber 22 is used only for generating the ion beam. Plasma doping is a known process for doping wafers and Bernstein et al. does not suggest or imply such a process. A wafer support disk 40 is used for mounting a wafer thereon downstream of the beam in the end station and moving the wafer with respect to the path of the beam. Bernstein et al. is only directed to beamline ion implantation and does not disclose any plasma doping of the wafer.

Henley et al. is relied upon to disclose a plasma immersion ion implantation (PIII) system for plasma doping a wafer 467 as illustrated in Fig. 4. However, Henley et al. is only directed to a PIII process and does not disclose a beamline ion implantation process. Therefore, Henley et al. does not suggest or imply combining a beamline ion implantation process with a plasma doping process in an integrated chamber as claimed in the present application. As Bernstein et al. is only directed to beamline ion implantation and Henley et al. is only directed to PIII processing, no suggestion or motivation is provided for combining these two distinct processes into an integrated process chamber. Specifically, the unique features and techniques for combining beamline ion implantation with plasma doping is neither suggested nor implied in these documents.

With respect to dependent claims 14-19, Goeckner et al is further relied upon to disclose a plasma doping apparatus having an anode 24 and a pulse source 30 as illustrated in Fig. 1. However, Goeckner et al. is only directed to a plasma doping process, similar to Henley et al., and does not suggest or imply combining a beamline ion implantation process with a plasma doping process in an integrated chamber as claimed in the present application. Therefore, Goeckner et al. fail to cure the deficiencies in the combination of Bernstein et al. and Henley et al. as discussed in the base rejection. Accordingly, it is respectfully submitted that claims 1-33

patentably define over the combinations of Bernstein et al. and Henley et al. and Bernstein et al. and Henley et al. with Goeckner et al. and it is respectfully requested that these rejections be reconsidered and withdrawn.

In view of these amendments and for all of the above stated reasons, it is respectfully submitted that all of the outstanding rejections have been overcome. Therefore, it is requested that claims 1-33 of the present application be passed to issue.

If any issues remain unresolved, the Examiner is requested to telephone the undersigned attorney.

Please charge any additional fees or credit any overpayments to deposit account No. 50-0896.

Respectfully submitted,
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